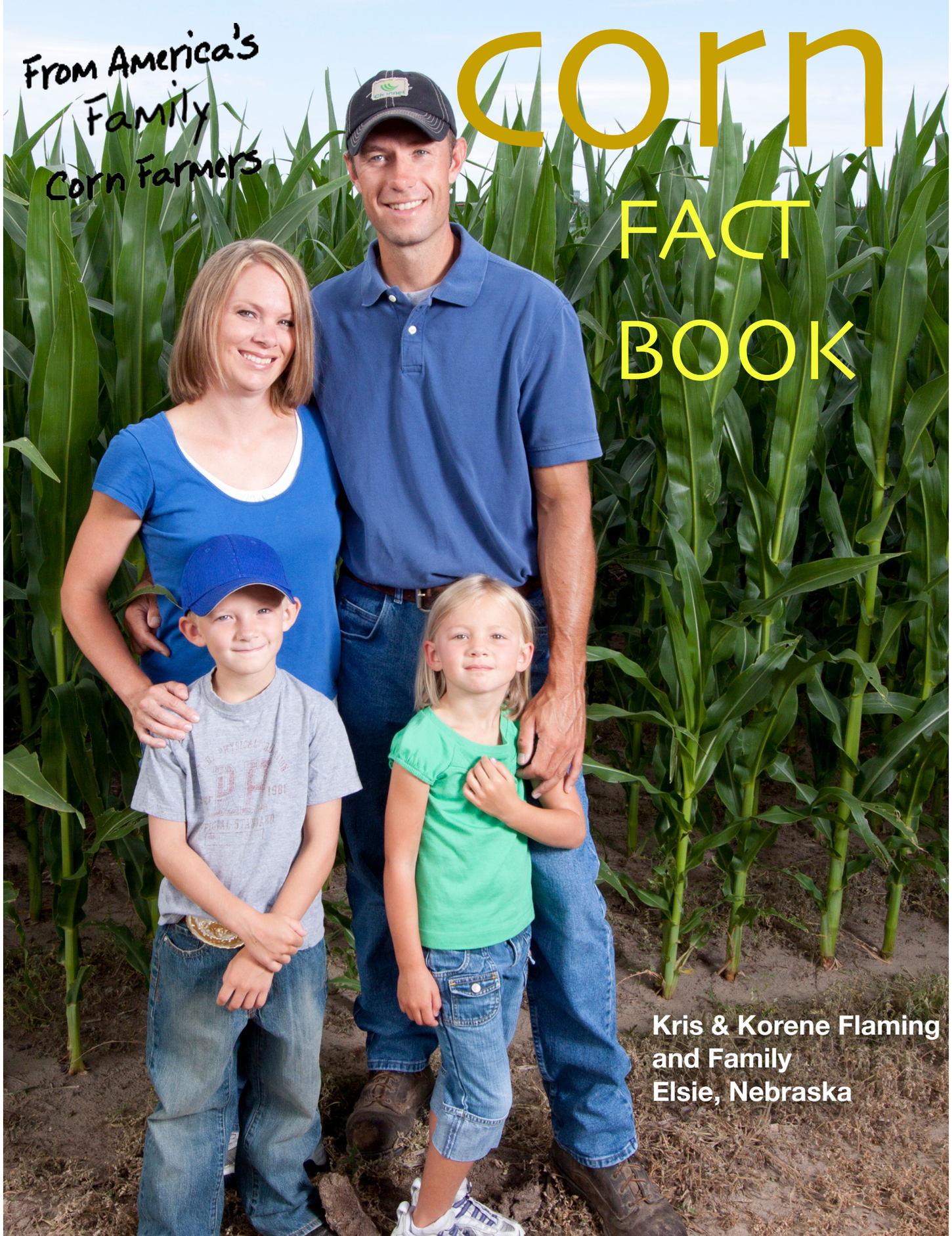


corn FACT BOOK

Kris & Korene Flaming
and Family
Elsie, Nebraska

Chapter 1

Introduction

A story of technology and innovation

Introduction

Through innovation, technology and hard work, America's corn farmers are producing record crops. This allows them to satisfy all the traditional uses of corn plus help the United States build a growing portfolio of renewable products that utilize corn as a feedstock.

These big crops come even though there are new challenges every year. From a cold spring to a hot spell during pollination, from too much rain to not enough, every year is different and farmers thrive through the adversity. It makes harvest, which may have its own set of challenges, that much sweeter.

The results of their efforts are astounding, with the highest yields and production numbers in history coming over the last eight years. In 2011, America's corn farmers produced a 12.4 billion bushel crop. It was the fifth year in a row with production exceeding 12 billion bushels, an incredible figure considering production had never before reached such levels. The amount of corn produced per acre, known as the yield, was 147 bushels per acre, the ninth year in a row with yields averaging more than 140 bushels per acre, another unprecedented figure.

How can this happen? How can American family farmers continue to produce more corn per acre? How can they produce 20 percent more corn per acre than any other country in the world? There are a lot of ways to answer these questions, but a big part of it is simply good old-fashioned ingenuity, hard work and the desire to contribute to a safe, abundant food supply.

Ingenuity comes from the willingness to try new things – to learn and adapt, to get better. Family farmers – who grow 90 percent of the corn in America – have certainly done that. They use more precise equipment and take advantage of the resources that allow them to adopt conservation tillage, which keeps the soil in place and holds in moisture. They check the nutrients in the soil and replace only what is necessary. They use seed that has a tremendous yield potential and the ability to protect itself from damaging insects.

Hard work? Well, that comes naturally to any farmer who relies so much on the weather, complex equipment and dozens of unplanned situations that require attention. It's simply the nature of the business – and farmers thrive on it.

Their success benefits many. After all, more than 300 million people living in this great country need to eat. Without corn farmers – all farmers – we wouldn't be here. Every year we ask farmers for more food, but give them less land on which to produce it. We want farmers to be more efficient and use less energy. Every year they manage to succeed – with less than 2 percent of the population committed to farming the land the best they can in order to provide the rest of the country with the safest, most abundant food supply in the history of the world. Certainly farmers should be respected for the work they do – and perhaps we should acknowledge that they may indeed know what they are doing.

Corn farmers, for example, ensure livestock and poultry producers have access to a high-quality feed ingredient. Plus they produce a crop in such bounty, skilled processors are able to convert corn into dozens of useful products that find their way into food and non-food applications. Ethanol producers, for example, convert the starch in each corn kernel into ethanol and return the rest as a concentrated protein feed for livestock. Researchers, meanwhile, are looking for even more opportuni-

ties to use corn as a replacement for dozens of petroleum-based products.

Why keep looking? Why do we keep exploring new opportunities for corn? The answer lies in the fact that corn yields continue to advance. We're talking average yields that in a decade may be 40 percent larger than today and 80 percent larger by 2030. This gives us many opportunities to take advantage of a crop adapted to grow incredibly well across the country and to make the most of the innovation and technology on America's family farms.

At the same time, farmers aren't resting on their laurels. They're getting better at what they do. Every year. They use fewer chemicals and fertilizers, practice conservation tillage and purchase high-tech equipment to ensure they are leaving their land in better condition than when they started farming. Certainly someone who works with the soil for a living wants to care for it in the best way possible – especially since corn farming is so often a multi-generational undertaking.

To family corn farmers, success isn't measured by a single growing season, but in the ability to produce a crop in the right way and leave that legacy for our future.

In this edition of *The Corn Fact Book* we highlight a few farmers and tell a bit of their story. We highlight some important facts and provide some background as to how American farmers became so successful at raising corn – and the opportunities that provides for us all.

In the mid- 1950's, Henry A. Wallace, former Vice President, former Secretary of Agriculture and an early developer of hybrid seeds, noted that the Corn Belt had developed into the "most productive agricultural civilization the world has ever seen."

The Corn Farmers Coalition

To help tell the story of the American corn farmer, farmers from across the country came together through their state corn organizations to found and fund the Corn Farmers Coalition. They partnered with their national organization – the National Corn Growers Association – to help highlight how farmers care for the land and produce corn in such abundance that it is available for use in many new industries.

The largest corn yields in history all occurred since 2003. Consequently, eight of the largest crops in history also occurred over the last eight years

The farmers who comprise the coalition have as diverse a set of interests and backgrounds as those who read this publication. However, the soil and the corn seeds they plant every spring tie them together. It gives them a common purpose and desire to let the world know how farming has changed – and the opportunity we have to grow a future around renewable products made from corn.

Raising a farm family

Jay and Emily Lynch of Humboldt, Iowa, are like a lot of family farmers. They have two young children, five-year-old Allison and two- year-old Nathan, who keep them busy, as do the part-time, off-farm jobs they enjoy. They farm with Jay's parents, who live down the road on a Century Farm, which means the farm has been in the family for more than 100 years.

"We're incredibly lucky to live on a farm and raise our children here," said Emily. "They'll grow up understanding the value of hard work, and what farming means, how our family contributes food and fuel to the community and country. We want them to have the same opportunity we have, to live on the land where their grandparents and great grandparents grew up."

Ensuring their children have that opportunity means caring for the soil and protecting other natural features around their farm. It also means striving to be more productive on every acre, while minimizing crop inputs.

"We want to produce as much corn or soybeans per acre as we can because that supports our family. With today's farming techniques, it's possible to have great yields, while improving the soil and protecting the environment," Emily said. "We love to go camping and fishing. It's an important part of our life. We protect those natural resources by farming smart and becoming better every year."

To that end, the Lynch's adopted strip tilling, a form of conservation tillage that leaves the residue from the previous year's crop on the field. They use GPS technology to ensure crop nutrients are applied only where necessary and every year they become more efficient.

"By caring for the land and environment, we'll continue producing great crops that help provide quality, safe food for our family and the country," Emily said.

95% of all corn farms in America are family owned.

Source: USDA

Lonier Family | Lansing, Michigan

The Lonier family began farming this Lansing, Michigan, land the same year America celebrated its 100th birthday. That year, Rutherford B. Hayes was elected President and the land was tilled with a plow and a mule. Now, 136 years and six generations later, the Lonier family are stewards of 3,000 acres of land they farm using GPS guided tractors and combines.

"The biggest changes that I have seen in my 20 years of involvement on our farm," said Scott Lonier, "is the technology that we use. From auto steering to using an iPad in the cab to watch how seeds are placed in real time."

The use of modern technology allows the farm to run more productively as each corn seed is selectively cultivated, precision planted with the help of GPS guidance systems and discreetly fertilized. It's the groundbreaking American technology that has allowed farmers like the Lonier's to grow 87 percent more corn per ounce of fertilizer than just a few short years ago.

"Farming is not a job, it's a way of life. Being able to use the land God gave us to feed the world is a daunting and important responsibility. I am confident that we are up to the challenge and my generation will leave the land in as good as, if not better, condition than when we took it over with our conservation and planting programs in place," said Scott.

CORN FARMERS COALITION

America's corn farmers are by far the most productive in the world, growing 20% more corn per acre than any other nation.

Source: USDA

Mike & Kelsey Bergren Family
Henderson, Nebraska

CHAPTER 2

Family Corn Farmers American Ingenuity

Nebraska's Corn Production Numbers

Year	Total Production	Bushels Per Acre Average
1900	191,100,000	26
1920	242,891,000	33
1940	95,489,000	21
1960	333,438,000	51
1980	603,500,000	85
2000	1,014,300,000	126
2001	1,139,250,000	147
2002	940,800,000	128
2003	1,124,200,000	146
2004	1,319,700,000	166
2005	1,270,500,000	154
2006	1,178,000,000	152
2007	1,472,000,000	160
2008	1,393,650,000	163
2009	1,575,300,000	178
2010	1,469,100,000	166
2011	1,536,000,000	160

By the time Lewis and Clark began their expedition from the Illinois Territory in 1804, corn had been grown successfully by settlers for more than a century across the continent. As it was domesticated over thousands of years prior, corn developed into a versatile crop, growing in a number of climates and soil types. Corn became a dependable staple across the Americas.

When reports from the Lewis and Clark scientific journey known as the "Corps of Discovery" began to trickle back east, farmers and settlers pointed their wagons west. They were looking to settle in the vast lands in the Central Plains described by Lewis and Clark as being fertile and rich. Perfect for growing corn, wheat and cotton. Perfect for providing the agriculture resources needed by a growing nation.

From this humble beginning of settlers scratching a living from the soil, farmers aimed to produce a better crop every year, to take one year's knowledge and apply it to the next. As it turned out, the vast Midwestern United States and its fertile soil is an ideal location to grow corn. As decades passed, farmer know-how exploded. Each generation learned and adopted improved farming methods, passing this know-how along to their children, continuing a cycle that's alive and well even today.

Soon, these fertile plains in the middle of the United States became known as the Corn Belt, even though the corn plant is widely adaptable, allowing it to be planted and harvested with great success in nearly every state and many countries around the world.

A hybrid by any other name

In the late 1880s, experiments involving a new method of breeding seed corn showed great promise. Corn, plant breeders found, can express heterosis or hybrid vigor.

This means plant breeders can take two corn plants with favorable characteristics and cross them – allowing one of the plants to pollinate the other. If all goes as planned, the "hybrid" seed produced from the mating would be superior to both parents when planted and grown. It could have a higher yield potential, be more uniform, grow as a hardier plant and more, depending on how inherent the desirable characteristics were in each parent.

Is a national average of 300 bushels of corn per acre possible? Consider this: The average yield of National Corn Yield Contest winners last year was 313 bushels per acre. If they can do it, certainly others will follow.

This understanding created immense opportunities. Suddenly plant breeders could cross and re-cross different varieties of corn with the hope of creating a hybrid that would outperform other corn seed. Universities and agriculture publications began to promote the benefits of hybrids and national corn yields began to rise as farmers, seeing the benefits in their own fields, purchased the latest hybrids every spring.

It was a new and exciting age of agriculture. In 1933, less than 1 percent of planted corn was hybrid. By the early 1940s, hybrid usage rose to 78 percent and continued upward. In the mid-1950s, Henry A. Wallace, former Vice President, former

Secretary of Agriculture and an early developer of hybrid seeds, noted the Corn Belt had developed into the "most productive agricultural civilization the world has ever seen."

Such productivity continues today, with America's corn farmers producing 20 percent more corn per acre than any other country in the world.

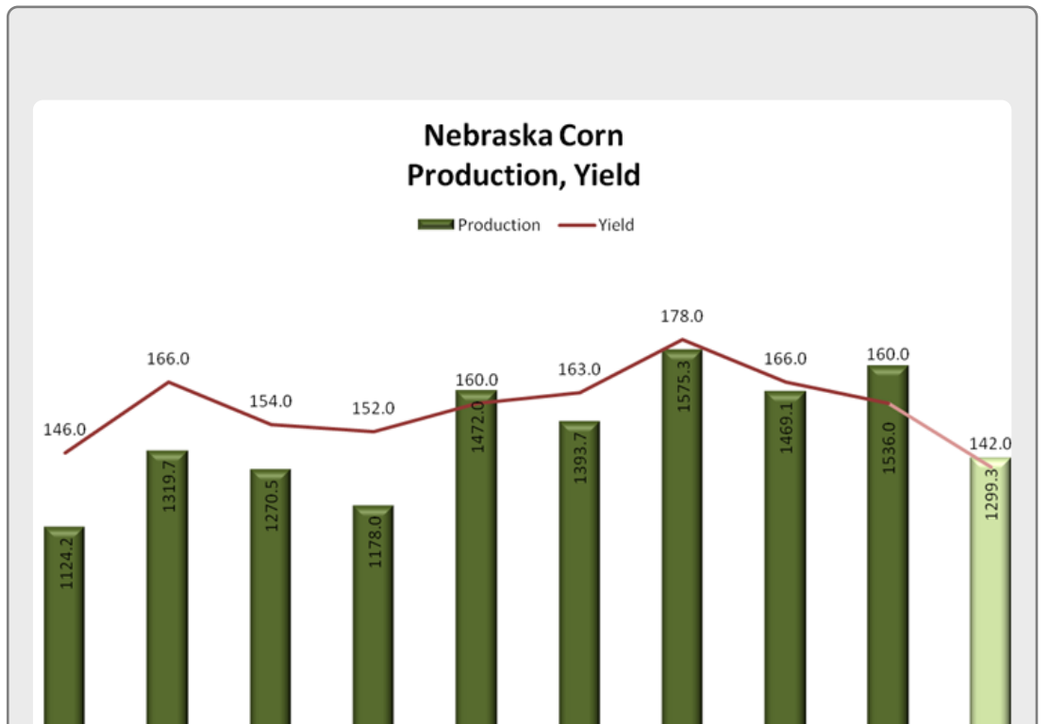
Record after record

How do America's family farmers outproduce everyone else?
The roots of this success run deep and wide.

There's know-how – the everyday working knowledge and understanding of how best to plant, raise and harvest a crop that's handed down from generation to generation. This is not simply tossing a few seeds to the ground and hoping for the best. It involves high-tech equipment that places hybrid seeds at the desired depth in the soil and the optimal number of seeds per acre. It's the ability to help keep that crop healthy during the growing season. The understanding of where plant nutrients are needed and when – and the technical savvy to do just that. The optimism to invest hundreds of thousands of dollars into a crop Mother Nature can wipe out in an instant.

Then comes the continuing advancement of hybrid seed corn – every year means better hybrid seeds for farmers. Plant breeders today have advanced tools to better predict which desirable characteristics will come from its two parents. They can identify those with potential and determine those characteristics before a single seed is ever planted in the ground. Add the advances gained through biotechnology and the potential from mapping the corn genome, and it's safe to say today's yields – unimagined only a generation ago – are just the beginning.

The largest crops in history have all occurred since 2003, with 12.4 billion bushels produced in 2011. That's enough corn to fill bushel baskets – the size of a small round laundry basket – that could go from the earth to the moon and back nearly seven times.

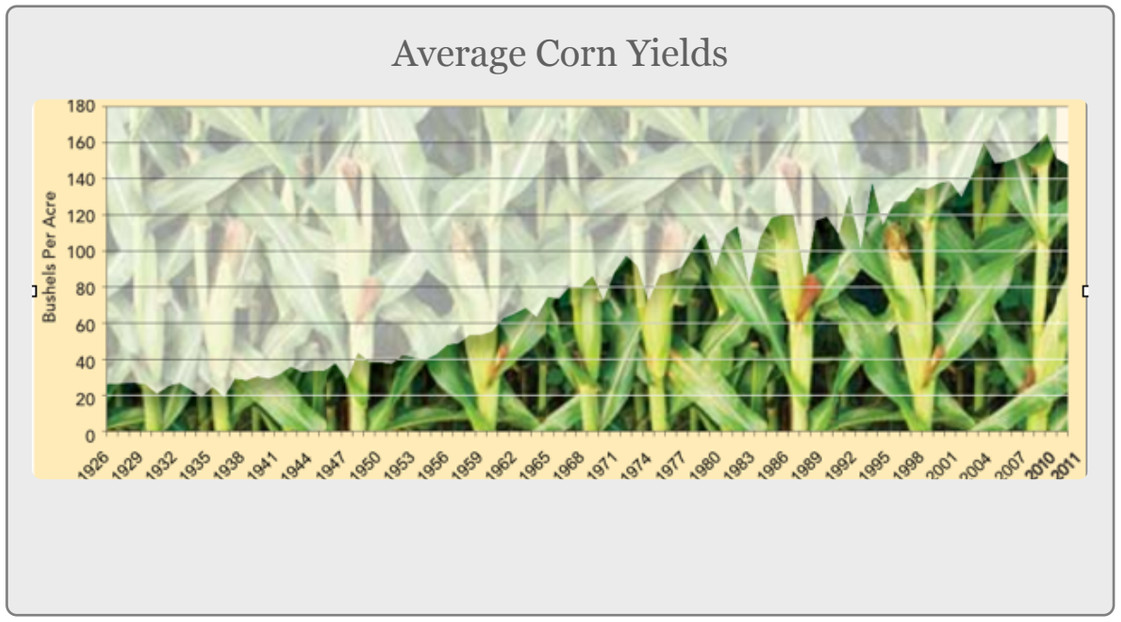


Yet even today's yields are impressive compared to those of just eight years ago. The national average of 147 bushels produced on each acre in 2011 was nearly 20 bushels larger than the average yield in 2002 – and plant breeding experts estimate yields may jump 40 percent before 2020 and, perhaps, hit a national average of 300 bushels per acre by 2030.

Is this simply a pipe dream? Consider this: The average yield of National Corn Yield Contest winners last year was 313 bushels per acre. Contest winners are generally trendsetters. If they can do it, others will certainly follow.

These higher yields mean we'll see crops of 15 billion bushels and more – all from the same number of acres.

Farmers saw this incredible upward trend in corn production coming. It's why they've invested in new markets and new opportunities, and because of this, we have the opportunity to use corn in ways we never thought possible – beyond the traditional markets.



America's corn farmers are by far the most productive in the world, growing 20% more corn per acre than any other nation.

Source: USDA

Harbage family | South Charleston, Ohio

Brian and Jennifer Harbage are the seventh generation to farm their family's land near South Charleston, Ohio. They are the third generation to live in the farmhouse, and their sons Aidan and Lane are the fourth. They raise corn, soybeans, wheat and hay, have a beef cattle operation and supply a nearby dairy farm with feed. "You can't ask for a better way of life as far as I'm concerned," Brian said. "We get to be our own boss and don't have to worry about punching a time clock."

They didn't get to be the seventh generation by accident. It took generation after generation caring for the land, each learning from the next. "We've been 100 percent no-till for 19 years, as that conservation practice is a better way for us to keep soil in place and reduce fuel usage while getting better yields," Brian said. "We also use every piece of technology we can to ensure fertilizer and other crop inputs go only where they are needed and stay there. We're better this year than five years ago and I can't even imagine how productive we'll be in a decade using even fewer inputs than we do already."

An acre of corn removes 8 tons of harmful greenhouse gas, more than that produced by your car annually.

Source: EPA

Roeder Family | Ida Grove, Iowa

Upon graduating from Iowa State University, Dan Roeder headed to Kansas City to work in the hotel industry. After meeting the woman who would soon become his wife, it wasn't long before they headed back to Dan's family's farm, making Dan and Fina the fourth generation of Roeders to work the land of Iowa.

Today, Dan and Fina Roeder raise three children and farm 7,500 acres of cropland. "Things have changed greatly since my forefathers farmed this land. Today we use conservation tillage, grid soil sampling to determine soil fertility and GPS for precision planting. It helps us produce more while protecting our precious top soil," said Dan.

By using modern farming practices, the Roeders are keeping water clean, using less energy, less fertilizer and protecting the environment for future family members to farm the land.

CORN FARMERS COALITION

Imagine the possibilities

So, American farmers are good at growing corn. Very good, in fact. How does that fit in with today – or tomorrow? How will the growing productivity of family corn farmers be used? How can we take advantage of this crop and cultivate its economic value?

For many years, farmers saw their expanding ability to grow corn stacking up against slow-growing demand. They decided to do something about it, forming organizations that could promote research, technology and invest in new markets.

After all, less than 1 percent of the country's crop is sweet corn – the kind we eat frozen, from a can or fresh off the cob. A vast majority of the crop is field corn – yellow corn comprised of starch, fiber, protein and oil. Farmers knew if they could develop new markets based on those components, they could keep corn supplies from getting burdensome and stifling ingenuity.

Certainly feed for livestock and poultry has also been a critical and important market for corn – and still is. Ditto for corn exports. Yet demand from both of these traditional markets has remained consistent over the years even as corn production continued to expand more quickly. Corn farmers weren't the only ones getting better: Livestock and poultry producers themselves produce more meat, milk and eggs with fewer inputs, including fewer bushels of corn.

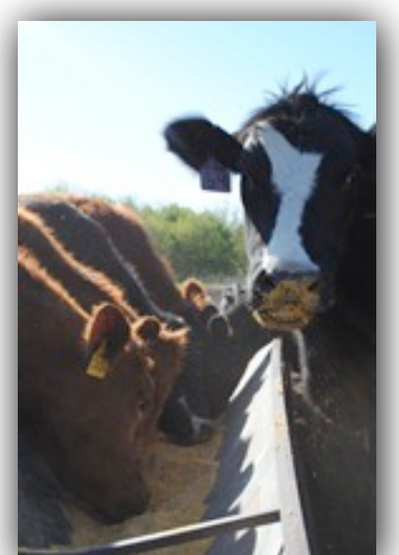
Unlocking the Kernel

Fortunately, as our knowledge of corn production grew, so did our understanding of the individual kernel. We began to discover new ways to harness the components that make up the kernel. Once companies saw the capabilities, dozens of new products made from corn came to market.

1 bushel of corn will produce: 2.8 gallons of ethanol, 17.5 pounds of livestock feed, up to 1.5 pounds of corn oil , and carbon dioxide

Corn starch, for example, has dozens of uses. It is a thickening agent and anti-caking agent. It helps frozen foods maintain their texture. Roasted starch – dextrins – are found in hundreds of adhesive applications. You can find citric and lactic acid produced from corn in hundreds of foods and other products listed in the *World of Corn* at www.ncga.com.

Fueling the Future

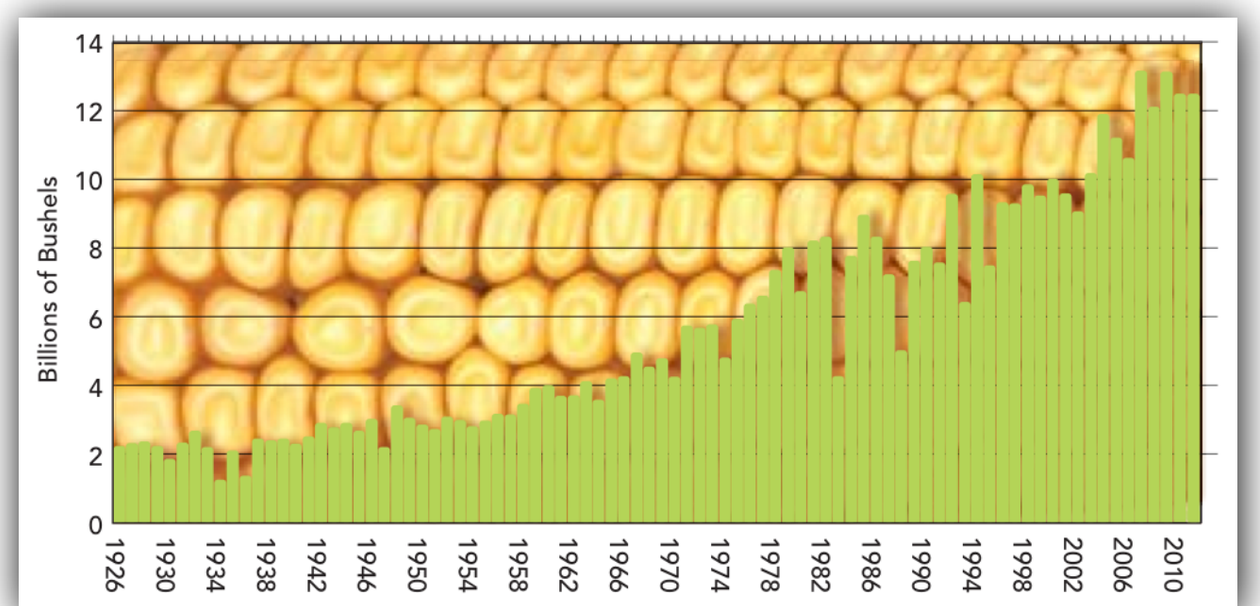


Another valuable use of corn is fuel ethanol. To make ethanol, only the starch portion of the kernel is converted to sugar and fermented – the rest of the kernel is returned as corn oil and high protein livestock feed, meaning we get multiple products from each kernel delivered to an ethanol plant.

Corn-based ethanol can be found blended with gasoline in most fuels sold today, making ethanol the most successful renewable fuel in history and delivering tremendous benefits to the entire country. In 2011, U.S. ethanol production supported thousands of jobs, contributed more than $40 billion to the nation's Gross Domestic Product and displaced more than 485 million barrels of imported oil. As the sector continues to grow, so will these positive developments.

Farmers saw that corn production was growing faster than demand. They knew that developing new markets would keep supplies from getting burdensome and stifling ingenuity.

U.S. Corn Production



Like corn farmers, ethanol producers are also getting more efficient. An article in the scientific journal *Biotechnology Letters* noted ethanol production has seen a 28 percent reduction in energy use, a 32 percent reduction in water use and a 5.3 percent increase in ethanol yields all in less than a decade.

A recent report from the U.S. Department of Agriculture noted corn-based ethanol has a net energy ratio of 2.3 to 1, meaning for every unit of energy it takes to make ethanol, 2.3 units of energy are produced as ethanol. Every year, that figure grows simply because corn and ethanol production gets more efficient. A study in the *Journal of Ecology* noted that between 10 and 19 gallons of ethanol are produced for every gallon of petroleum used in the entire corn to ethanol production life cycle.

Helping keep energy costs down is important because farm products like corn represent only a little more than 11 percent of retail food prices, according to a new report from USDA. Nearly 33 percent of each food dollar is spent on food processing, packaging and transportation – all energy intensive activities – and actual energy costs.

Corn is incredibly versatile and our ability to grow it so successfully allows us to use it in a number of non-traditional ways - from ethanol to bioplastics.

Corn-based ethanol is a growing success – yet farmers know it is just the beginning. Soon, more ethanol may come from corn cobs and other agricultural biomass, and thanks to corn-based ethanol leading the way, fuel markets will be ready.

Another petroleum replacement

You can find corn-based plastics in a growing number of utensils, gift cards, safety seals, bags, plant containers, weed barriers, water bottles and more. These versatile plastics are compostable, meaning that over time they will break down completely when composted.

Others take these corn bio-materials and spin them into fabrics, again replacing oil-based polyester and nylon. These materials are soft on the skin and have a number of performance advantages. Alternatively, tough, stain resistant corn-based fibers are spun into carpets.

Yet these petroleum-replacing products are just the first wave. Research underway now will result in greener chemicals for industrial applications, replacing their oil-based counterparts.

Yes – there is a trend here. Corn is incredibly versatile and our ability to produce it so successfully allows us to use it in a number of non- traditional ways. All it takes is a little imagination and ingenuity.

Jon Holzfaster Paxton, Nebraska

Fuel and feed from the same bushel

Some of Jon Holzfaster's corn ends up at a corn-based ethanol plant – and the cattle in his cattle feeding operation couldn't be happier for what they get in return.

"That return is distillers grains – a feed ingredient produced by corn ethanol plants," explained Jon, a farmer from Paxton, Nebraska. "Ethanol plants only use the starch in the kernel of corn, so the rest of that kernel comes back as livestock feed," he said. "Cattle love it and they perform very well when it is in their feed."

Ethanol, essentially, is a two for one bargain. "We get fuel and feed, not one or the other," said Jon, who holds a degree in ag economics from the University of Nebraska.

Jon also practices precision agriculture on his farm, which provides many benefits. "My fuel supplier called wanting to know what he could do to get our business back," he said. "The fact was, we hadn't switched suppliers. We were simply saving so much fuel that it was having a visible impact on his revenue."

Jon uses "strip-till" practices, a type of conservation tillage that involves preparing a narrow seedbed and applying seed and fertilizer precisely using satellite-based technology that is accurate to less than an inch. "We're preparing the ideal environment for the seed as we till, fertilize and plant in one pass – and that saves time and fuel," he said.

A third-generation farmer, Jon said farmers have changed with the times through a combination of necessity and technological advancement.

"We're more efficient than ever. We're using less fuel and traveling across the land fewer times. We have better genetics to help us optimize yields from existing acres and our use of chemicals has decreased dramatically," he said. "In this respect, the good old days are actually happening right now."

GALLERY 3.1 Corn Graphs

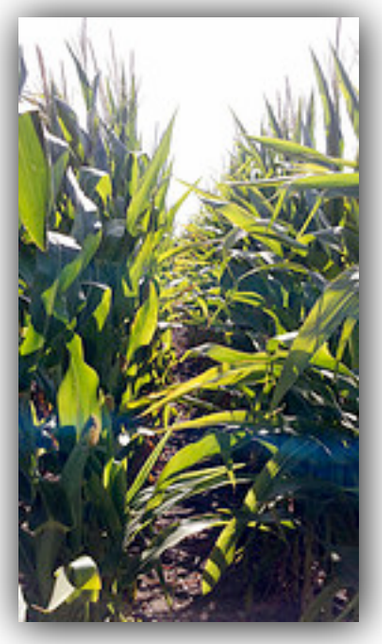
Basic uses of corn

Cleaner and Greener

Cleaner and Greener

At the same time corn farmers produce record crop after record crop – and discover new ways to use those crops – they've changed how they grow it, too.

In other words, the way things were done 20, 10 and even five years ago simply don't apply any more. Things change: management practices, equipment, technology, science. It all comes together in a tractor cab, which, in some cases, is as wired (and wireless) as a business park.



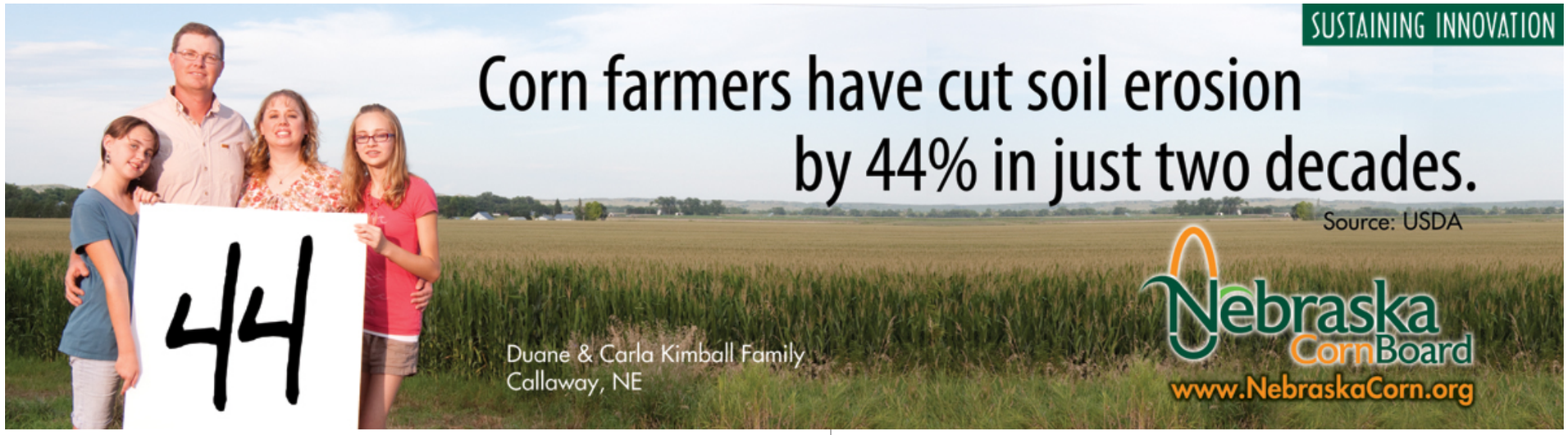
Today's farmers have adopted conservation tillage on millions of acres of land – and continue to expand the use of these no-till and minimal till practices. The benefits for the environment are significant. No-tilling means remnants from the previous year's crop are left untouched. Not only does this improve the soil over time, but it significantly reduces soil run-off during snowmelt or heavy rain. In fact, the U.S. Department of Agriculture noted America's corn farmers have cut soil erosion 44 percent in two decades by using these innovative conservation methods.

Yet eliminating run-off keeps more than just soil in the field where it belongs. It also keeps crop nutrients in place and holds moisture in the soil during the growing season. Plus, by traveling across the field less often, farmers use less diesel fuel. Using less fuel means using less energy – and the energy used to grow a bushel of corn has fallen 37 percent because of this and the adoption of other technologies.

It all ties together well – but it's not the whole story. Conservation tillage is an option for more farmers today because of technological advances. Corn plants that are resistant to safer herbicides means controlling weeds in a no-till field is more efficient and less harmful to the land – and people. Seeds that resist insect damage mean fewer insecticides are needed to protect the crop, and that means fewer passes across the field. These technologies are made possible through advances in biotechnology.

Farming by 'prescription'

If you're familiar with GPS in your mobile phone or car's navigation system that lets you know if you should turn left or



right, you have an idea of what farmers have access to in the tractor cab.

What farmers use, however, is much more precise – all the way down to less than an inch accuracy. This precision agriculture technology does more than just provide directions – it actually steers the tractor or harvesting equipment, keeping it on track while the farmer monitors the other pieces of technology and goings-on. It reduces overlaps in the field, which are wasteful because they use more seed and nutrients and require more passes in the tractor.

Along the way, an on-board computer keeps track of everything through an entire growing season – from how many seeds are planted on every acre, to where crop nutrients and other inputs have been applied to how many bushels are being harvested at the end of the year. All this data is available via a thumb drive or wirelessly to a home computer.

What does that data provide? It lets the farmer see how a field performed – what parts of the field had high yields and what parts didn't. When combined with soil sampling, which checks the nutrients available to plants in different parts of the field, custom fertilizer applications are possible.

This means a farmer applies more nutrients in some areas that

need it and less in others. The goal is to have only what is needed by the plants in the right place every season. If a farmer has advanced technology in his planter, he can even control how many seeds are planted in different parts of the field – more seeds where yield potential is higher and fewer where it isn't.

Combined, all of this technology and know- how is referred to as "prescription agriculture," because farmers calculate and then prescribe everything from crop inputs to seed placement at multiple points across a field. The plan is carried out with the assistance of the on- board computer, which controls, based on the prescription, how much fertilizer is applied as the tractor moves across the field.

America's corn farmers have cut soil erosion 44 percent by using innovative conservation tillage methods

Thanks to these and other innovative fertilization methods, it's estimated that American corn farmers are producing 85 percent more corn per ounce of fertilizer applied today than a couple decades ago.

What does the future hold?

The advancements made over the last few years in how farmers grow corn are just the start. While the accomplishments are incredible, research continues for new ways to reduce farmers' environmental footprint while growing yields.

The understanding of conservation tillage, the timing and placement of nutrients and more will grow over time. Production methods like cover crops are gaining interest and advanced hybrids will offer new opportunities to produce corn with fewer inputs.

One example is a drought tolerant corn hybrids, which are starting to come to market. These hybrids allow corn to yield better when stressed by a lack of water- times when Mother

Nature brings on the heat and rain is lacking. It will also allow farmers in more drought-prone areas around the world to produce more consistent crops.

There are more than 300,000,000 people living in the United States. Only 2,000,000 farm so the rest of us can eat - and of that number 300,000 are family corn farmers.

Actually, many hybrids grown today are already more drought tolerant than those grown 20 and 30 years ago because their roots have built-in insect protection. Strong roots allow plants to reach down farther for water and better take up nutrients.

All of this is important because the only water most American-grown corn receives comes in the form of rainfall. In fact, 89 percent of the crop is only watered by Mother Nature. The rest also receives rainfall, but is supplemented with some water via irrigation – although technology and know-how have significantly reduced the amount of water applied.

What else does the future hold? Well, it's pretty wide open, especially considering that scientists have decoded the corn genome. Researchers are essentially looking at a blank slate. It's exciting to imagine – the opportunities are endless.

"Our collective definition of a 'good job' has evolved into something that no longer resembles Work, and that has detached us from a great many things, including our food, and the people who provide it"

-Mike Rowe at MikeRoweWorks.com

Ken, Joe and Evan Davis
Leesburg, Ohio

Technology means more with less

Like a growing number of U.S. farmers, Ken Davis uses a global positioning system to assist in planting seeds and applying just the right amount of fertilizer on his fields.

It helps produce more corn without increasing input costs from chemicals such as fertilizer or herbicides, said Ken, whose farm is outside Leesburg, Ohio, a town of 1,200 surrounded by the checkerboard squares of dozens of other family farms.

Four generations of Davises have farmed this land, going back to 1932. Yet these days Ken, who has a master's degree in agriculture, has a leg up: New technology means larger yields every year with less of an environmental impact.

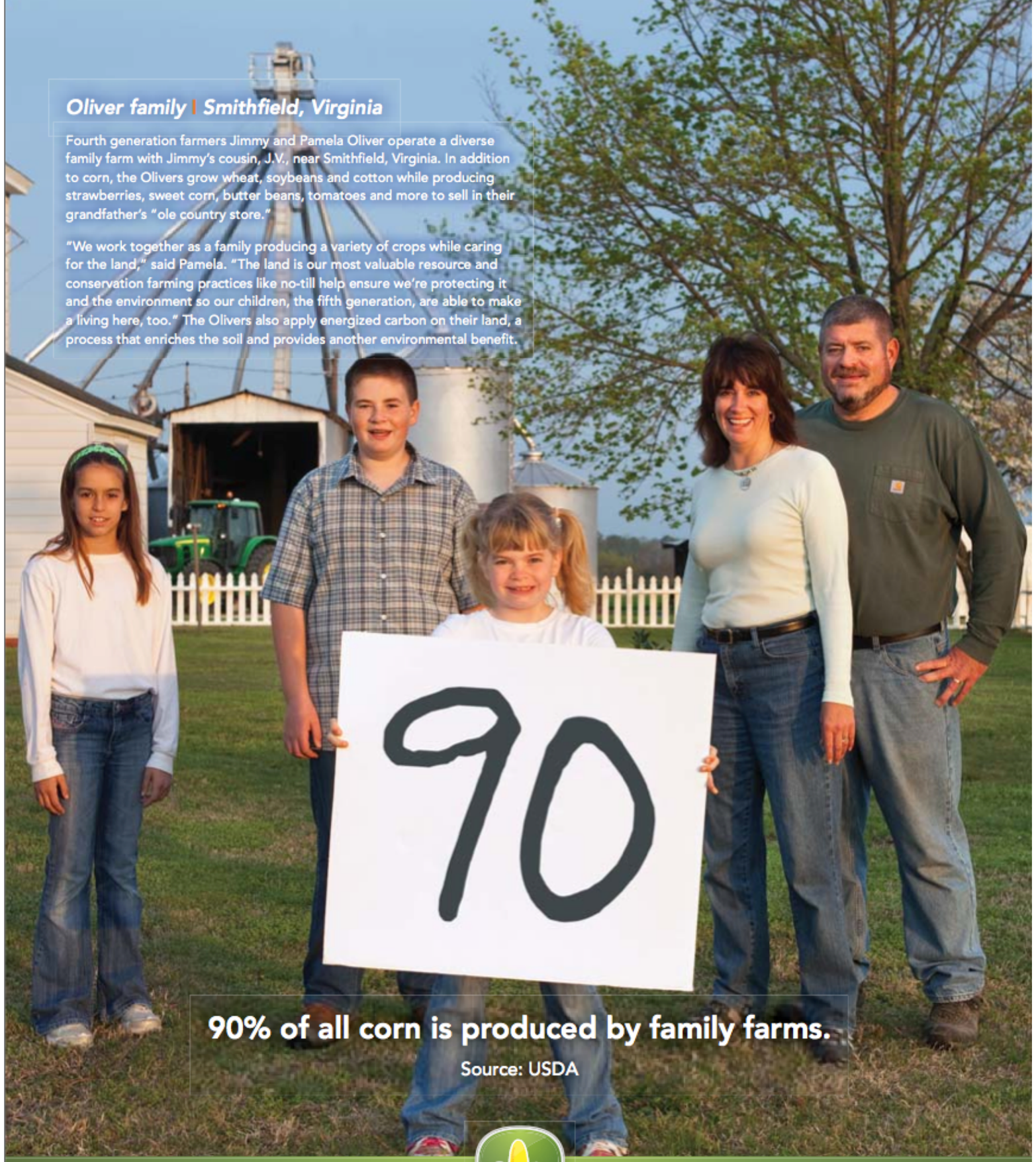
Ken figures the fields he's already cultivating using GPS are saving him 10 percent in fuel, seeds and pesticide. He'll also be doing less tilling of his corn, which saves about 40 percent of the fuel he needs to plant and harvest his crop, disturbs the land less, prevents erosion and keeps greenhouse gases in the soil and out of the air.

"Every year," Ken says, "corn farmers are proving to the world that we can, and are, producing an abundance of safe, healthy, nutritious food, feed and fuel, and we are doing it while improving the quality of our environment, our communities and our economy. Next to our creator and our family, the land is a farmer's greatest asset. Only by caring for the land can we hope to reap any reward."

Oliver family | Smithfield, Virginia

Fourth generation farmers Jimmy and Pamela Oliver operate a diverse family farm with Jimmy's cousin, J.V., near Smithfield, Virginia. In addition to corn, the Olivers grow wheat, soybeans and cotton while producing strawberries, sweet corn, butter beans, tomatoes and more to sell in their grandfather's "ole country store."

"We work together as a family producing a variety of crops while caring for the land," said Pamela. "The land is our most valuable resource and conservation farming practices like no-till help ensure we're protecting it and the environment so our children, the fifth generation, are able to make a living here, too." The Olivers also apply energized carbon on their land, a process that enriches the soil and provides another environmental benefit.



90% of all corn is produced by family farms.

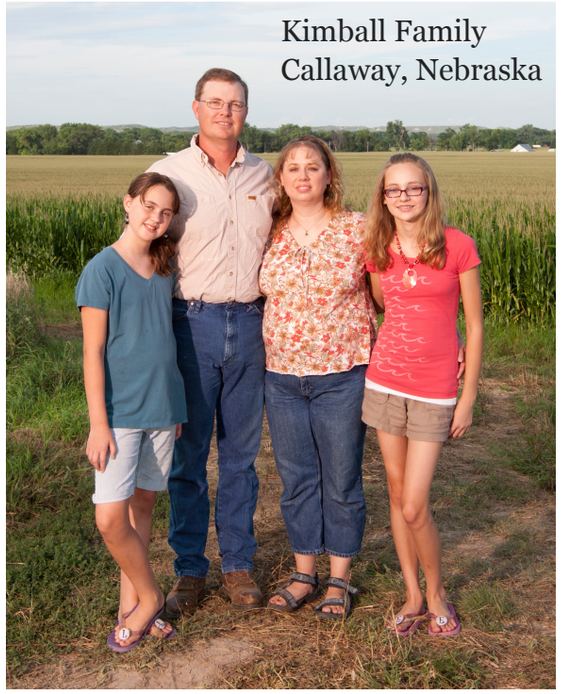
Source: USDA

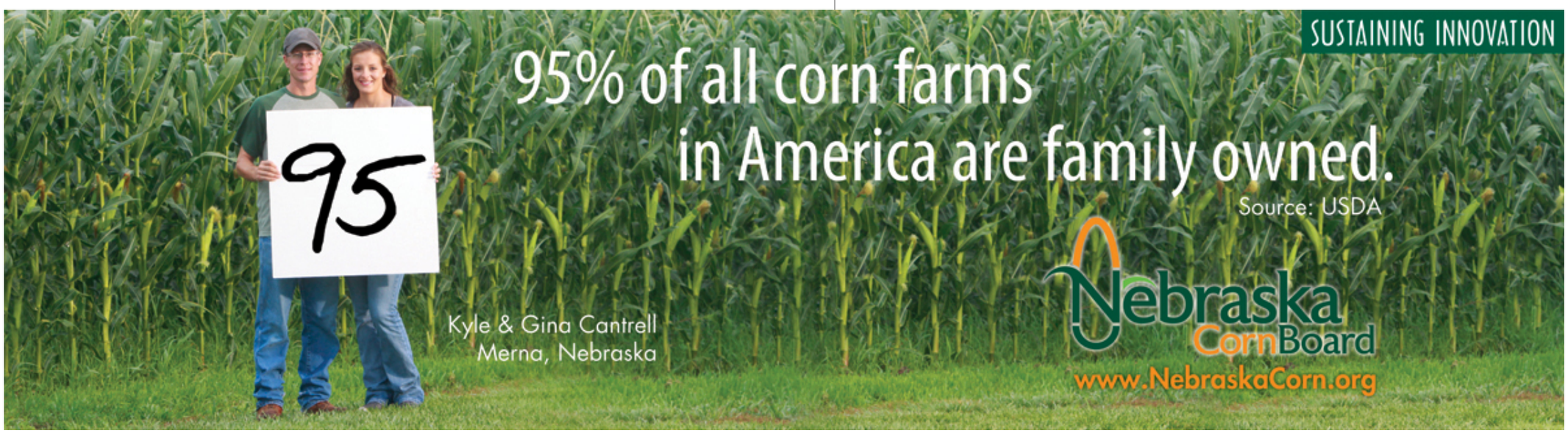
CORN FARMERS COALITION

CHAPTER 5

Down-to-Earth People

Long Family
Grant, Nebraska


Kimball Family
Callaway, Nebraska



Down-to-earth people

Why does a farmer farm? Planting a seed every spring takes a bit of optimism – hoping the seed will grow and mature, that there will be enough rain but not a storm to wipe out the crop, that there will be enough warm days but not so much heat that it stifles the crop. Corn markets move up and down, seemingly at a whim. It's quite a life.

Yet, it's a life farmers wouldn't trade for anything.

Why? The reasons are as varied as the farmers themselves. Some feel called to do the work they do, working with land and watching a crop grow and mature. They love the lifestyle and living in a rural community. They are proud of producing grain that feeds animals and people and helps fuel a nation. They appreciate the opportunity to work in a multi-generational business. They love to watch their kids grow up learning to appreciate hard work and stewardship. They take great pride in their work, while caring for the land and water, so their farm can be passed along to the next generation.

Of course, these are generalizations, and while true for many farmers, they may not tell the whole story for others. Thanks to new technology, however, it is easier for anyone to reach out to a farmer and ask a question.

> "Farming looks mighty easy when your plow is a pencil and you're a thousand miles from the corn field."
>
> -Dwight Eisenhower

Get to know a farmer

The opportunity to talk directly to a farmer is due, in large part, to new communication tools, including smart phones. They allow farmers to be online where they are accessible to others – from Facebook to Twitter to blogs.

More and more farmers understand that they need to tell their story – how they farm and why – so people have a better understanding. Social media and its related tools make that easier, especially since a growing number of farmers utilize smart phones to post photos and videos while commenting on what they are doing or answering questions.

Those who have questions about farming can go online and search them out. On Twitter, a popular hashtag or word to search for is "#agchat." Many farmers of all kinds follow that hashtag and would be able to help – or seek out the answer.

While there are more than 300 million Americans – and growing – less than 2 million are involved in farming and provide the basis for all the food we enjoy today. If broken down further, there are only about 316,000 corn farms in the United States and 95 percent of those – some 300,000 – are family farms, many of which are multi-generational.

That's a small amount of the total population, but their output is staggering – they produce the corn that feeds livestock and poultry, provide the basis for beneficial ingredients in food and industrial applications, expand the opportunity to develop green solutions that are an alternative to petroleum and provide the feedstock for ethanol plants which in turn provide fuel and feed.

Tom, Riley, and John Tibbits

Minneapolis, Kansas

Telling the story one tweet at a time

When Tom Tibbits gets his corn in – or is battling the weather to manage his crops – chances are he'll tweet about it.

Tom farms with his dad John and granddad Riley near Minneapolis, Kansas, and enjoys having conversations on Twitter (his handle is @ksfarmboy). He also takes the time to write a blog that includes a number of photos in addition to an explanation.

"Pictures give people a chance to see what's happening instead of me just explaining it in words," he said. "It really helps tell the story."

Tom, who has three young kids with his wife Sandy, said he spent some time working away from the family farm in between stints at college. "I lived in a suburb for a while and got to see urban sprawl first hand," he said. "After coming back to the farm, I saw a report about the great interest some people living in the city had about how wheat is grown. That got me thinking that I should try and share my own story of farming with anyone who would care to read about it."

That's how Tom's blog got started – but after getting a new smart phone, he decided to give Twitter a try. "I thought Twitter was a neat tool and have enjoyed it," he said. "It gives me a chance to be involved in a lot of conversations and help people to better understand what we do and why."

He encouraged those who are interested or have questions about farming to go online and to talk to farmers. "There are a growing number of farmers out there who would appreciate being asked a question about what they do," he said. "They are on Twitter, Facebook and blogging, it's just a matter of looking."

The Tibbits' farm produces corn, wheat, sorghum, soybeans and sunflowers – all of which are tweeted about and included in Tom's blog.

Cantrell Family | Merna, Nebraska

Kyle and Gina Cantrell are the fourth generation of farmers to raise crops – and a family – on land near Merna, a small village in north central Nebraska. The couple grew up only nine miles apart, and Kyle says Gina is the glue that keeps the farm together.

They have three children, eight-year-old Grace, six-year-old Owen and Kipp, who's not quite a year. "We are proud to be farmers and to be growing crops on the same land my great grandfather did," said Kyle. "Our hope is to pass on the land to our children and that they will continue the family tradition of caring for the land and improving our stewardship with each generation."

Kyle and Gina operate their farm, which includes 5,200 acres of corn and soybeans, as well as angus cows, with Kyle's parents, Don and Deb. They also raise bred heifers that are sold to cattle producers every December.

The Cantrell's said tackling the challenge of continuous improvement in stewardship, while also increasing productivity and meeting the expanding needs of society, is a goal they love pursuing.

America's corn farmers have cut soil erosion 44% by using innovative conservation methods.

Source: USDA

Farmers are experts at what they do, choosing to live a life that involves a tremendous risk in the markets and weather, because they love doing it. Yet they are often taken for granted and pushed to the side, because we've forgotten our roots – we've forgotten that farming and agriculture are the backbone of this nation and that without it, the civilized life we enjoy wouldn't exist.

Agriculture – farming – and corn production are truly an American success story – but the story isn't complete. In some ways, the best chapters are still to come.

To learn more about Nebraska's corn production visit www.nebraskacorn.org

GALLERY 5.1 Growing Corn

90% of all corn is produced on family farms

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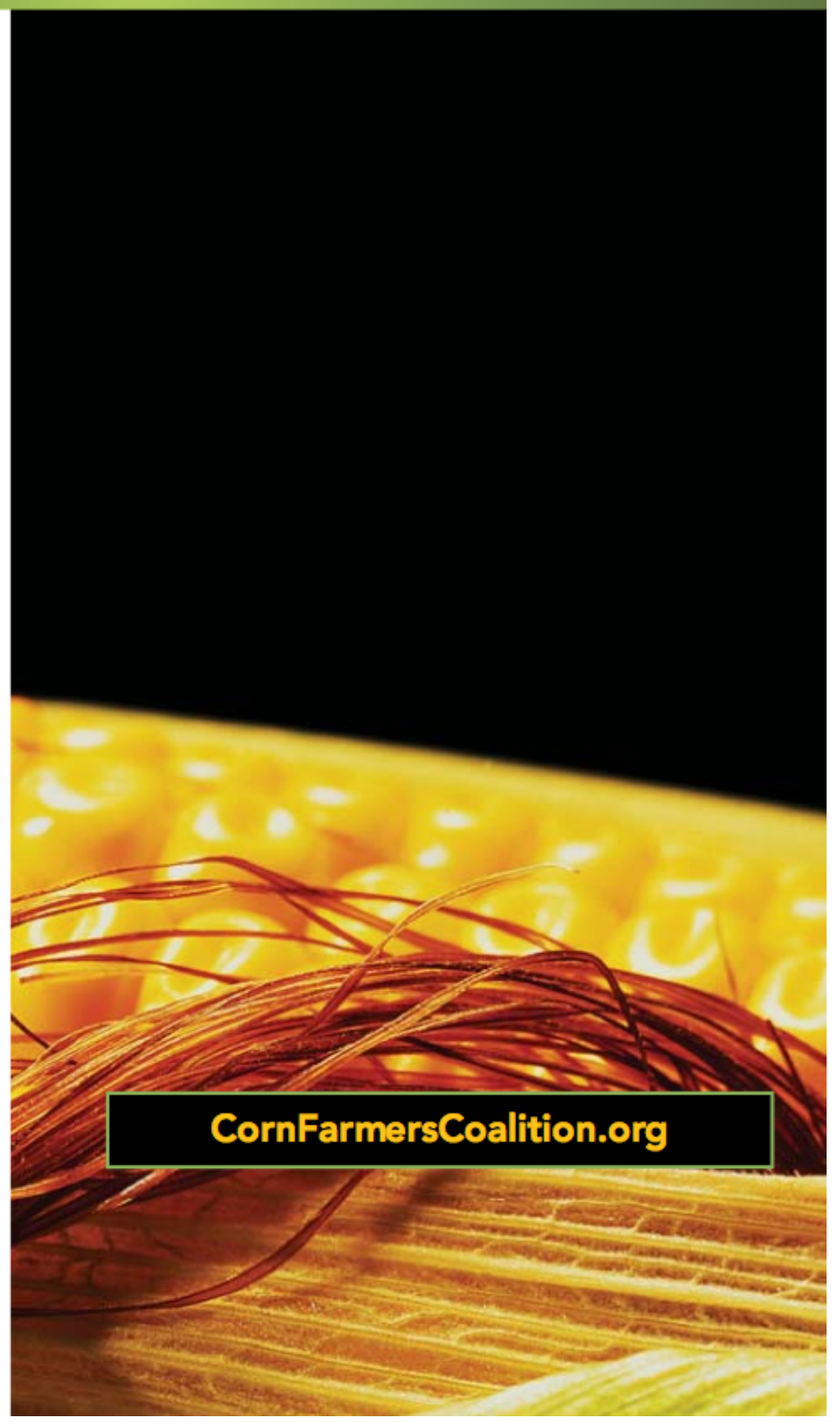
All facts in *The Corn Fact Book* and related communication efforts have been sourced from U.S. Department of Agriculture, U.S. Environmental Protection Agency and other organizations. For more information and details, please go to CornFarmersCoalition.org



The Corn Farmers Coalition – an alliance of the National Corn Growers Association and 14 state corn associations – educates policy-makers in Washington about how innovative farmers are growing more corn every year with fewer resources while protecting the environment.

Nebraska Corn Board; proud supporters of the Corn Farmers Coalition

www.nebraskacorn.org

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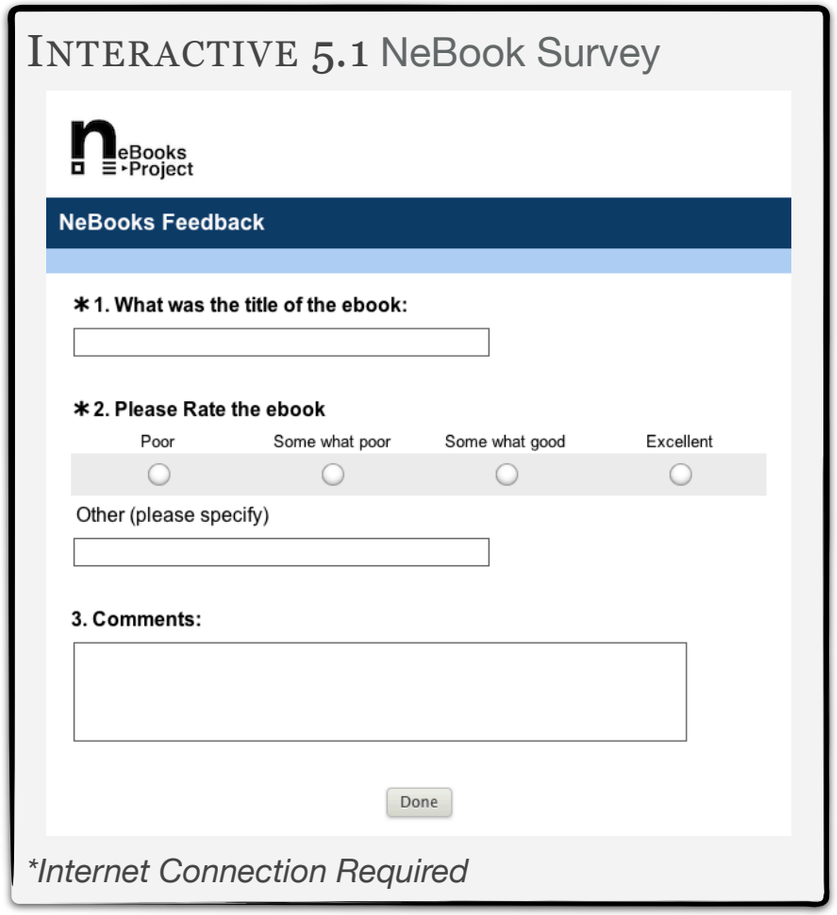

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